



DRInet in 5 Minutes

- an NSF Interop project

Purdue University



Developing Community-based DRought Information Network Protocols and Tools for Multidisciplinary Regional-Scale Applications (DRInet)

- NSF funded Data Interoperability project
- Started in Jan. 2009
- Multidisciplinary team
 - Carol Song (HPC)
 - Daniel Aliaga (CS)
 - Jake Carlson (Library)
 - Indrajeet Chaubey (ABE)
 - Rao Govindaraju (CE)
 - Chris Hoffmann (CS)
 - Dev Niyogi (Ag/EAS)
 - Lan Zhao (HPC)
 - Grad and undergraduate students, data expert





Objective & Challenges

- Implement and explore *computational infrastructure* to create a science base for drought information collection, fusion of heterogeneous data relevant to droughts, and for facilitating the broadest possible participation of the community
- Challenges
 - Various information is out there, but not standardized, not utilized to their potential.
 - Regional and local level – lacking systematic way of collecting information and data, data synthesis and dissemination
 - Ad hoc data collection mechanism
 - Lack of ways to include uncertainty information in drought classification
 - Heterogeneous dataset
 - Diverse needs for data and information



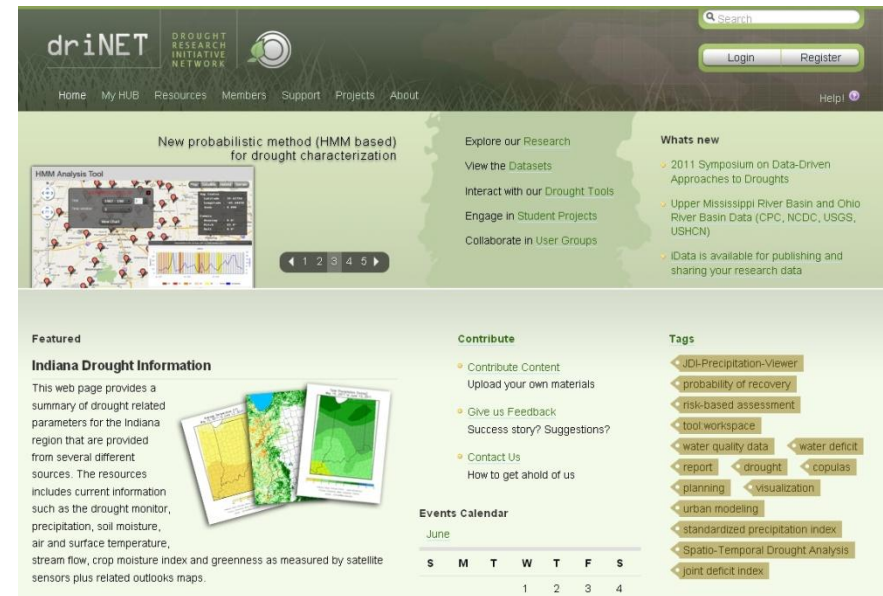
Approaches

- Community driven
 - Stakeholders on advisory board
 - Workshop in 2011 (participation from multiple domains, state and national operations centers and agencies, industry, students, international)
 - Data/info needs from diverse user base
- Research areas
 - Drought classification
 - Drought implications on water quality
 - Drought implications on air quality
 - Data synthesis
 - Visualization-based decision tools
 - Metadata (balance of depth & breadth, standards & local needs)
- Collaborate with other projects
 - U2U (USDA)
 - Teaching



Cyberinfrastructure

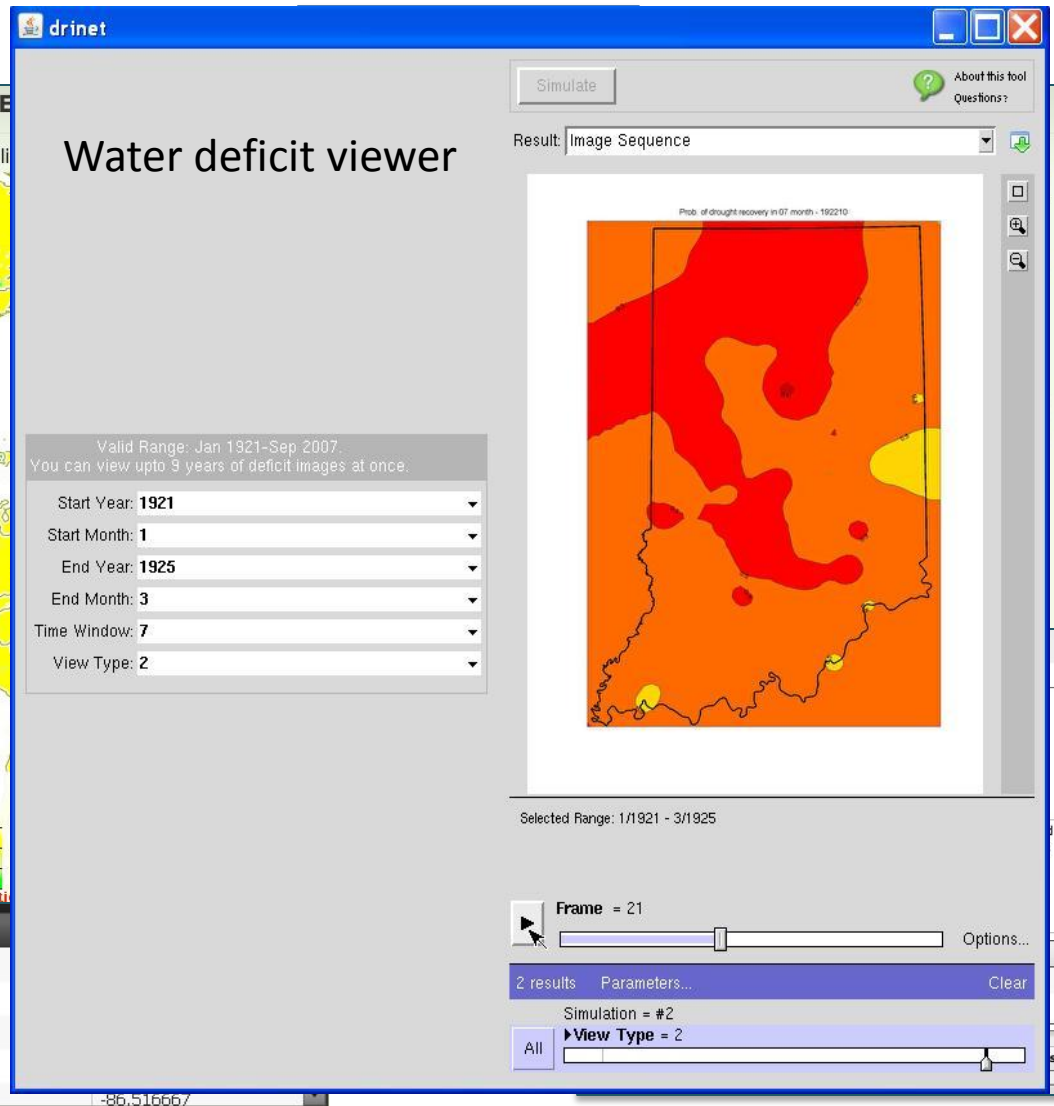
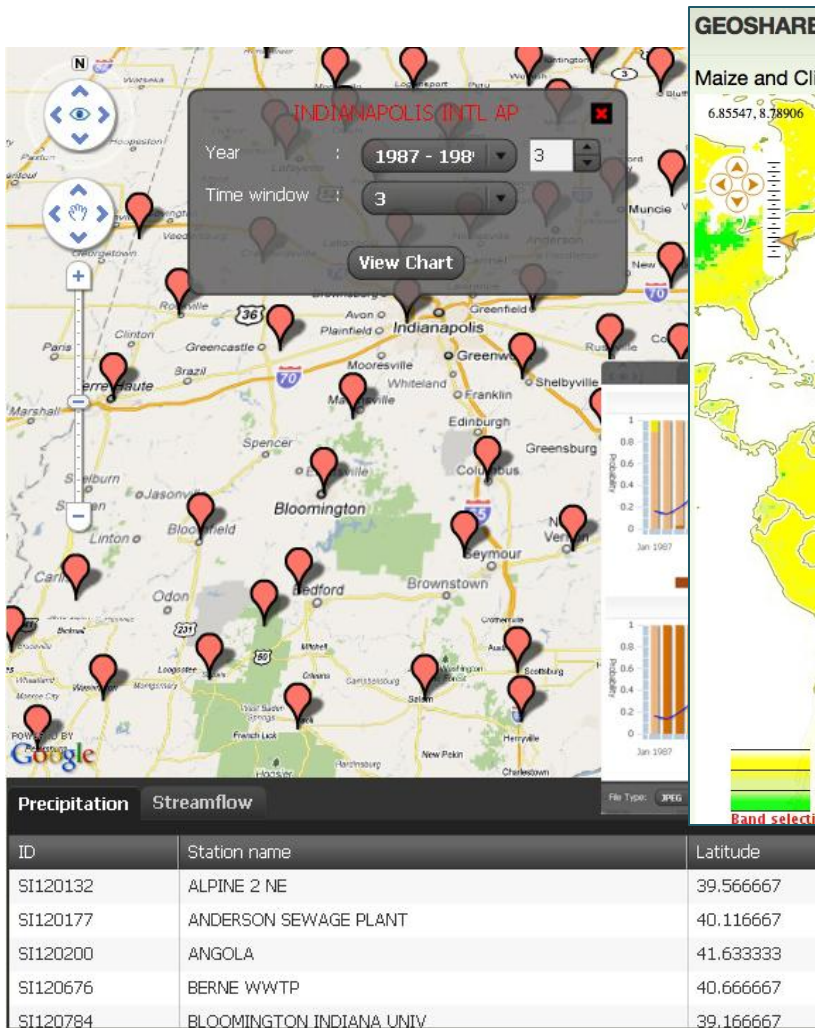
- DRI-net CI based on HUBzero for
 - Online interactive tools
 - Sharing and user participation
 - One stop shop for researchers, students and end users
- Expanded capabilities
 - Distributed data access
 - Self data and metadata publishing
 - Map-based navigation
 - Geospatial data enabled
 - Connecting data with tools, models, visualization





Interactive Tools

HMM-based Probabilistic Drought Classification





Data

Water quality data

Matson Ditch AT DeKalb CR 39, IN

- Variable: Bacteria
- Sub Var: Ecoli
- Original Num of Data Points: 221
- Start Date: 1996/09/25
- End Date: 2008/10/29

Show Details Get Data Plot

Monthly Average of Ecoli Count at

Matson Ditch AT DeKalb CR 39, IN



Historical Averages of Precipitation and Temperature Data

This dataset include plots of historical time series of average precipitation and temperature data, courtesy of the Oklahoma State University.

IL

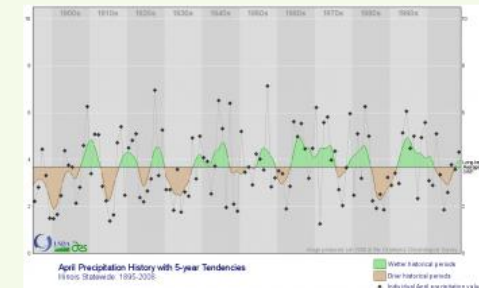
IL.zip

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- trace.IL-CD00.prcp.April.png
- trace.IL-CD00.prcp.August.png
- trace.IL-CD00.prcp.Autumn.png
- trace.IL-CD00.prcp.December.png
- trace.IL-CD00.prcp.February.png
- trace.IL-CD00.prcp.January.png
- trace.IL-CD00.prcp.July.png
- trace.IL-CD00.prcp.June.png

File Name:

trace.IL-CD00.prcp.April.png

Preview:

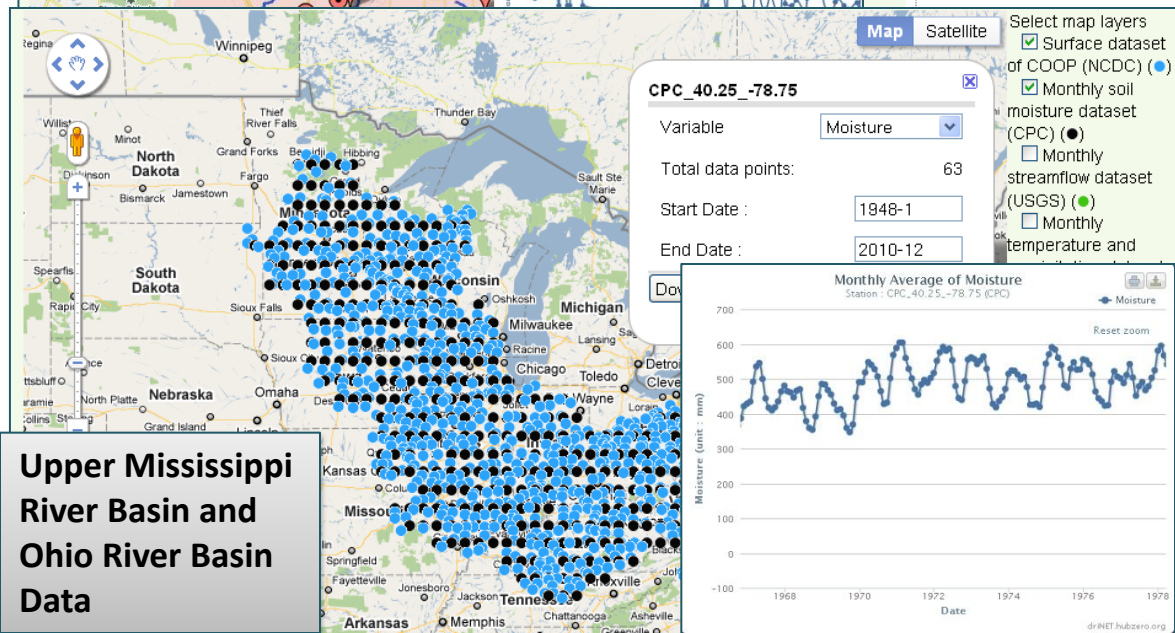
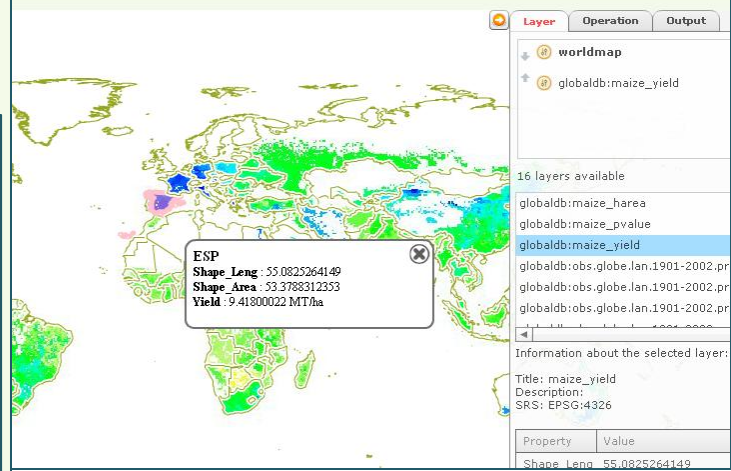


View graph in full size

File size (22758 Byte)

yield data

(Double click on available layers to browse the data, and click on Operation to see a preview of the data.)



Upper Mississippi River Basin and Ohio River Basin Data



Data Publishing

iDATA Publish, Browse & Discover

Data explorer

Current Path : MASSIE CREEK

▼ MASSIE CREEK

- Date/Time
- Level
- Temp
- Sp Cond
- pH
- Turb+
- ODOsat

Date/Time	Level	Temp
2010-10-01 22:00	0.324	14.97
2010-10-01 22:30	0.322	14.85
2010-10-01 23:00	0.321	14.74
2010-10-01 23:30	0.32	14.64
2010-10-02 00:00	0.32	14.51
2010-10-02 00:30	0.319	14.41
2010-10-02 01:00	0.319	14.31

Sharing Massie Creek Water Quality Dataset

Select a group to share the collection

Group: **drinetteam**

Privilege: **Read + Append**

Shared with:

Group Name	Access	Date
public	Read only	2011/03/19
drinetteam	Read+Append	2011/03/19

Tabular Data Import Wizard (Step 1 of 4)

Schema Definition

Define a database schema

Specify a schema for the tabular data

Name	Data Type	UQ
Datetime	Datetime	<input type="checkbox"/>
Avg Level (m)	Real number	<input type="checkbox"/>

Tabular Data Import Wizard

Importing data

Now, importing data into database. Please wait...

Importing data

Creating a database table...

The database table was successfully created.

Uploading the file ...

Upload completed.

Importing data into database...

Importing completed.

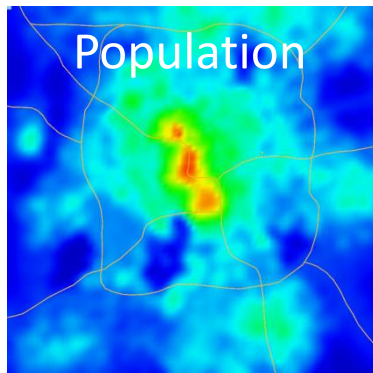
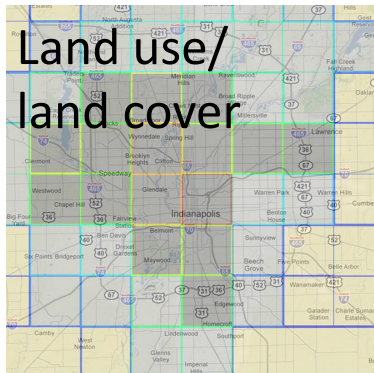
Finish **Close**



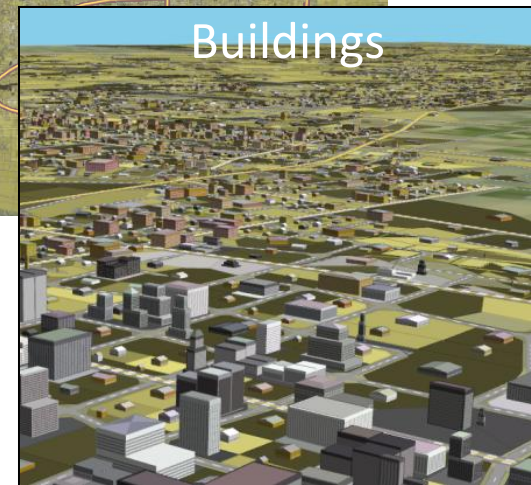
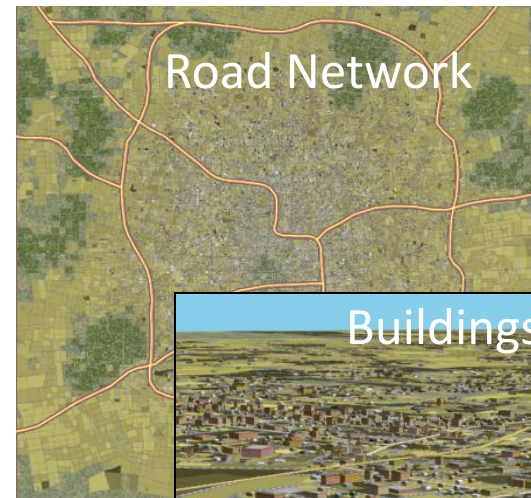
Urban Weather Modeling



Data

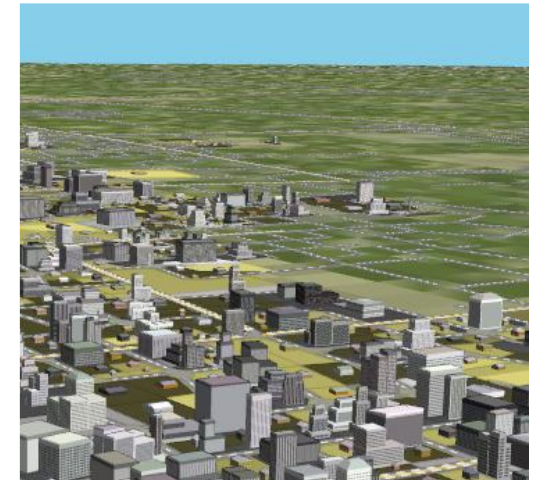
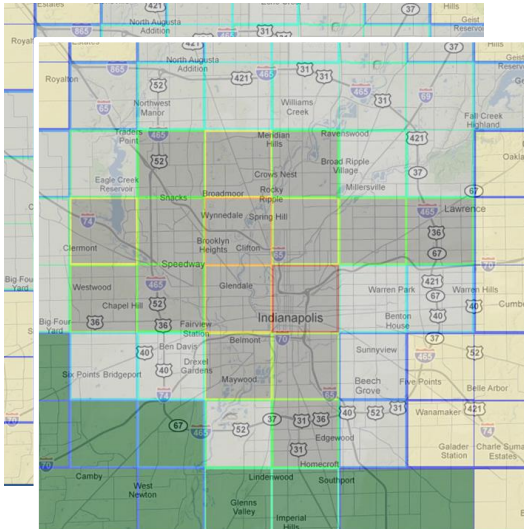


Result





Urban Weather Modeling



Modify land use (e.g.,
application of greening policy)

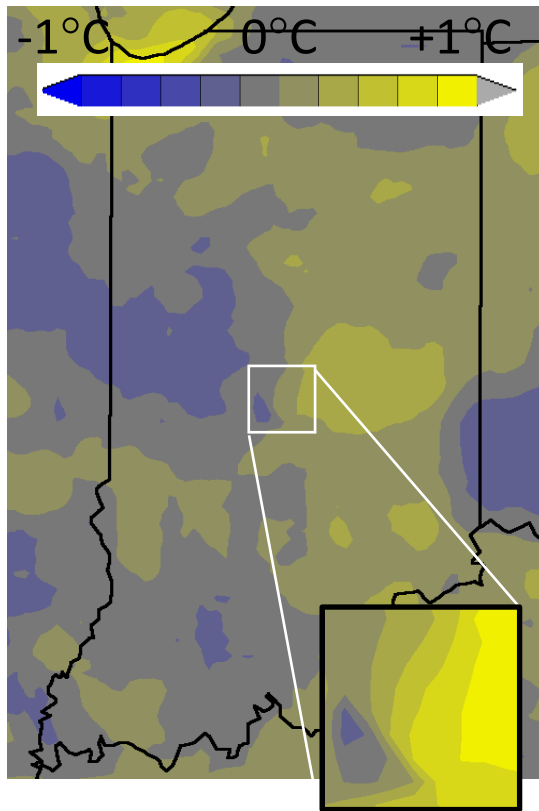
New fully instantiated city model is produced



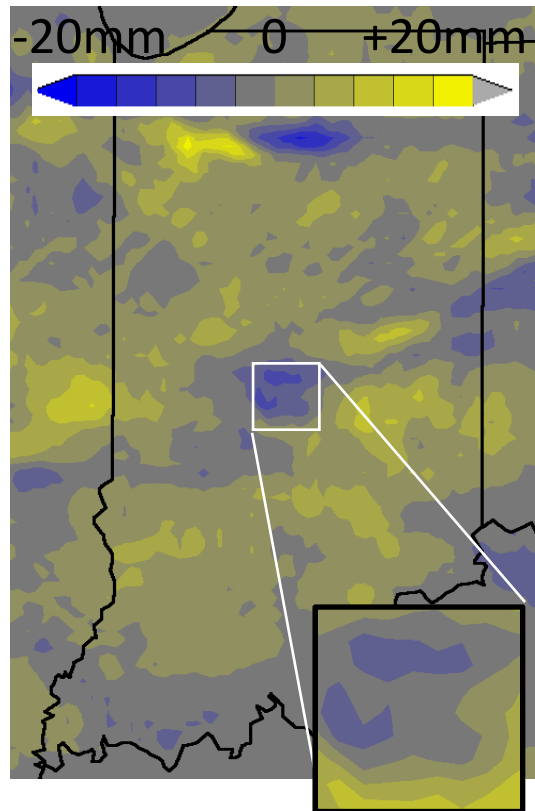
Example Changes in Local Weather



Temperature



Rainfall



Humidity

